AMENDMENTS

In The Specification:

Please amend specification as follows:

[0003.1] Figs. 1a and 1b are cross-sectional views of a printed circuit board showing a conventional process of forming a through hole connection between two circuit layers. Figs. 2b and 2c are cross-sectional views of a printed circuit board showing a conventional process of forming a blind hole connection between two circuit layers. To form a connection between two circuit layers within a printed circuit board, a hole is mechanically drilled or laser-drilled in a location where copper films 200 together with intermediate an insulating core layer [~~200~~] 100 overlap. The hole may be a through hole 300 (as shown in Fig. 1a) or a blind hole 310 (as shown in Fig. 2a). A copper layer serving as a seed layer is formed on the copper films 200 and the interior walls of the hole (300 or 310) by an electroless plating. Thereafter, a copper electroplating is conducted to form a copper layer (as shown in Figs. 1b and 2b) over the seed layer. Finally, a centrally hollow conductive copper ring for connecting the electrical circuits on each side of the circuit board and acting as an inter-layer conductive medium is formed.

[0004.1] In the conventional method, the copper layer is formed by connecting the upper and lower conductive layer 200 to a negative electrode and performing an electroplating after the seed layer is formed. Hence, growth rate of the plate layer is fastest on the upper and lower sides of the through hole 300 (Fig. 1b) due to easy access of electroplating solution. A

consequence of this is that the upper and the lower region of the through hole 300 are likely to be filled first, thereby forming a hollow interior. This also happens to the opening side of the blind hole 310. In brief, the process of forming a seed layer before electroplating produces an inter-layer conductive medium having a hollow center. To minimize such problem in the wire layout, width of an opening pad (Δr in Fig. 3) enclosing the hole is often increased and a connecting patch 410 is formed next to the hole to serve as landing pad for connecting with other layers. Ultimately, efficient utilization of surface area across a printed circuit board is not possible.

[0005.1] In addition, the absence of a solid interior in the inter-layer conductive medium fabricated by a conventional process also leads to other problems. For example, when a circuit pattern is formed over the copper film 200, a misalignment of the opening pad 140 (as shown in Fig. 4a) may lead to an over-etching of the copper layer 200 (as shown in Fig. 4b). The over-etched copper layer 200 may lead to poor electrical connection or electrical failure. To reduce such connectivity problems, the conventional remedy includes increasing the area of the opening pad 140. However, increasing hole pad area reduces area utilization of the printed circuit board.

[0023.1] As shown in Fig. 5b, a first patterned mask layer 520 (step 703 in Fig. 6) is formed enclosing the printed circuit board. The first patterned mask layer 520 has a third opening [~~522~~] 322 that exposes a portion of the first conductive layer 212. The first patterned mask layer can be a photoresist or a photosensitive polyimide layer formed, for example, by a

dry filming or a wet filming process. As shown in Fig. 5c, the exposed first conductive layer 212 (step 704 in Fig. 6) is removed to form a first opening 320 that exposes a portion of the insulating layer 110. As shown in Fig. 5d, the first patterned mask layer 520 is removed (step 705 in Fig. 6).

[0024.1] As shown in Fig. 5e, a laser beam or a mechanical drill bit is used to drill (step 706 in Fig. 6) a hole in the exposed insulating core layer 110_so that a second opening 321 is formed. The second opening 321 exposes a portion of the second conductive layer 214. As shown in Fig. 5f, a second patterned mask 560 (step 708 in Fig. 6) is formed enclosing the printed circuit board. The second patterned mask 560 exposes the second opening 321 and an edge portion 581 of the second conductive layer 214. The edge portion 581 of exposed the second patterned serves as an entry point for an electroplating current. The second mask layer 560 can be a photoresist or a photosensitive polyimide layer formed, for example, by a dry filming or a wet filming process.